

Persimmons

- 1. Some persimmon varieties contain tannins, which cause astringency. What are tannins? What are other sources of tannins?**

Primary/Secondary-level response:

- Tannins are astringent polyphenols found in some plants or unripe fruit that give off a bitter taste.
- Tannins help to bind and build proteins.
- Others sources of tannins can be found in: green tea plants, pomegranates, blueberries, chocolate and red wine. (The skins of red grapes contain small traces of tannins, but they are sometimes compounded during fermentation.)

- 2. Persimmons are high in antioxidants. What are antioxidants and what do they do for the body? (Depending on grade level, answers will vary.)**

Primary-level response:

The burning of nutrient fuel (fats and carbohydrates) to provide energy for bodily functions occurs by oxidation. A constant supply of oxygen is required for these oxidative processes. Even so, if oxidation occurs too vigorously, damage to the body's molecules and tissues can occur. This damage is particularly likely to occur when oxidation occurs by highly reactive oxygen molecules called free radicals. If the body's DNA is damaged by free radicals and is not repaired, the long-term risk for cancer increases.

Antioxidants are chemical substances that help protect the body's cells against damage from cancer-causing free radicals. Common vitamins with antioxidant properties include vitamins A, C and E, carotenoids, and bioflavonoids.

- 3. What is beta-carotene? Describe how beta-carotene is converted to vitamin A in the body.**

Primary-level response:

Beta-carotene is a substance found in yellow and orange fruits and vegetables and in dark green, leafy vegetables (e.g. apricots, carrots, spinach). Beta-carotene is converted to vitamin A in the intestines and liver.

Secondary-level response:

Beta-carotene is one of several carotenoids, which are natural plant pigments found in yellow and orange fruits and vegetables and in dark green, leafy vegetables (e.g., apricots, carrots, spinach). Beta-carotene is also an antioxidant, which is a substance that protects cells from the damage caused by free radicals. Free radicals are unstable molecules that are made by the process of oxidation during normal metabolism. Beta-carotene is converted to vitamin A in the small intestines and liver. Vitamin A is a fat-soluble vitamin and is stored in the liver and fatty tissues of the body.

- 4. Create a presentation on several fruits and vegetables from each of the different plant parts we eat (e.g., leaves, stems, roots, fruits, etc.). List the key nutrients and health benefits of each. Which health benefits are most important to you?**

Primary-level response:

Examples of fruits and vegetables from the different plant parts:

- Roots: beets, carrots, jicama, potato, radish
- Stems: asparagus, celery
- Leaves: cabbage, lettuce, spinach
- Fruits: apple, avocado, banana, cucumber, bell pepper, squash, tomato
- Flower: artichoke, broccoli, cauliflower
- Seeds: beans, corn, peas
- For more examples and/or extension lesson, visit:

www.cde.ca.gov/Ls/nu/he/documents/ntrtogrow1.pdf

[Web link to find out key nutrient contents of listed fruits and vegetables:

www.fruitsandveggiesmorematters.org (visit *Key Nutrients in Fruits and Vegetables* section)]

Secondary-level response:

Examples of fruits and vegetables from the different plant parts:

- Roots: beets, carrots, jicama, potato, radish
- Stems: asparagus, celery
- Leaves: cabbage, lettuce, spinach
- Fruits: apple, avocado, banana, cucumber, bell pepper, squash, tomato
- Flower: artichoke, broccoli, cauliflower
- Seeds: beans, corn, peas

For more examples and/or extension lesson, visit:

www.cde.ca.gov/Ls/nu/he/documents/ntrtogrow1.pdf

[Web link to find out key nutrient contents of listed fruits and vegetables:
www.fruitsandveggiesmorematters.org (visit *Key Nutrients in Fruits and Vegetables* section)]

5. What are the top three persimmon-producing counties in California? Locate on a map. When do these regions harvest persimmons? What similarities are there between these counties (e.g., climate, location, geography)?

Primary/Secondary-level response:

- The top three persimmon-producing counties are:
 - Fresno (4,390 tons)
 - San Diego (3,195 tons)
 - Tulare (3,030 tons)
- Harvesting takes place from October through mid-December.
- These counties are in warm, sunny areas with temperatures that generally do not drop below freezing.
- Fresno and Tulare counties are inland and do not have high winds.
- Persimmons grown in San Diego are grown more inland and also protected from winds by mountains.

Sources:

www.fruitsandveggiesmatter.gov/benefits/index.html
www.nal.usda.gov/fnic/foodcomp/search/
www.crfp.org/pubs/ff/persimmon.html
www.umm.edu/altmed/articles/beta-carotene-000286.htm
www.ext.colostate.edu/pubs/foodnut/09315.html
www.cde.ca.gov/Ls/nu/he/documents/ntrtogrow1.pdf
<http://lpi.oregonstate.edu/infocenter/phytochemicals/carotenoids/>

Updated: April 2011